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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/817,270	03/27/2001	Ryoichi Inanami	03180.0278	7690
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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 12/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/817,270

Applicant(s)

INANAMI ET AL.

Examiner

Phillip A. Johnston

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Detailed Action***

1. This Office Action is submitted in response to RCE / Amendment filed 10-05-2005, wherein claims 1,7, and 15 have been amended. Claims 1-34 are pending.

***Claims Rejection – 35 U.S.C. 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

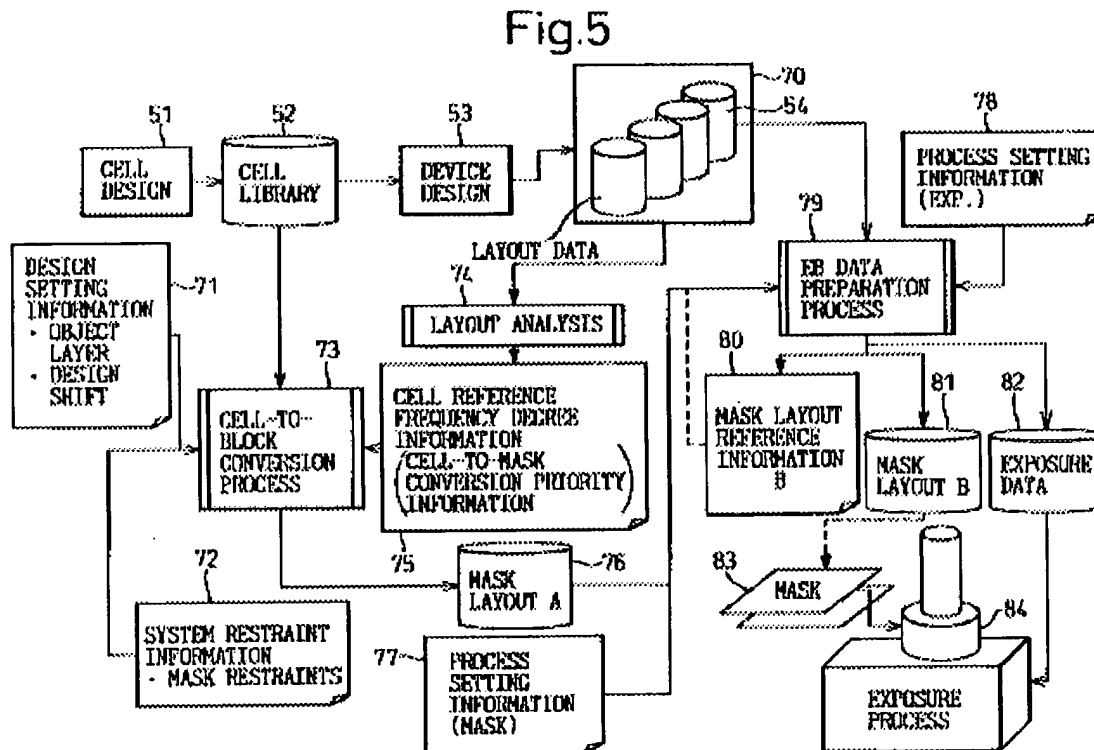
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,546,544 to Kawakami, in view of Hoshino, U.S. Patent No. 6,225,025.

Kawakami (544) discloses a method of producing a mask for electron beam fabrication of an integrated circuit that include the following;

(a) Producing mask data, where block (CP) apertures are selected via cell design process 51, which uses a basic element (standard cell) library 52, and device design means 53, to arrange (place) the cells and the wiring between the cells thereby,

designing (logic synthesis) the desired device, which is stored as layout data 54, as recited in claims 1,7,9,12-15,18,24,28,32, and 34. See Column 3, line 35-65; Column 7, line 48-67; Column 8, line 1-7; and Figure 5 below;

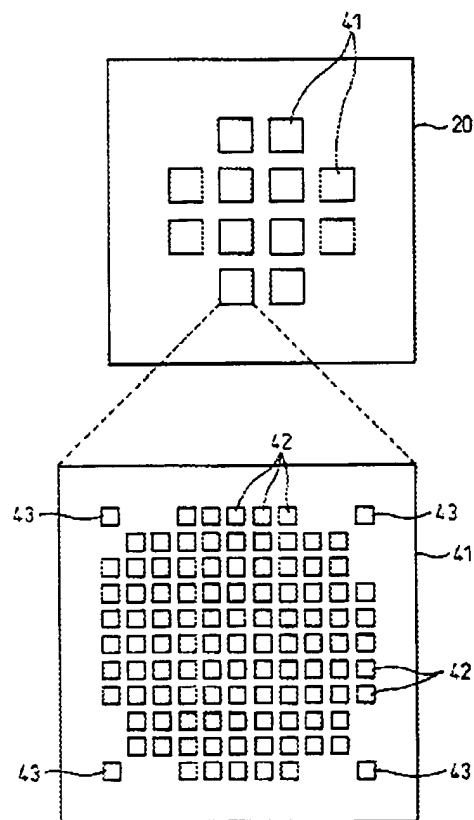


(b) Selecting variable beam (VSB) for exposing the wiring between cells, to be carried out separately with variable rectangle apertures; i.e., without using the basic (standard) cell apertures, as recited in claims 1,2,5,7,8,15,16, and 26. See Column 2, line 60-67; Column 3, line 1-10; and Column 6, line 1-12.

(c) Determining placement and routing (layout) of the mask blocks (apertures), based on frequency of use to maximize throughput, as recited in claims 1,6,7,15,11, 19, and 21. See Column 3, line 50-67, Column 4, line 1-26; Column 6, line 13-25; and Column 8, line 8-28;

(d) The block mask 20 is limited to about 100 block patterns 42 in the mask area 41 which are selectable without movement as shown in FIG. 3. Further, in accordance with the mask layout 60, the exposure data 61 including the block pattern select information and the corresponding information on deflection position is produced and stored, as recited in claims 3,7, and 15. See Column 4, line 1-26; and Figure 3 below;

Fig.3



(e) If fully efficient exposure is not possible a new mask is created, as recited in claims 10,18,23, and 31. See Column 9, line 55-67; and Column 10, line 1-4.

Kawakami (544) as applied above fails to teach the use of standard cells on CP apertures listed in an order of frequency of use according to a difference between a VSB shot number and a CP shot number, as recited in claims 20-23,25,27,29-31, and 33. However, Hoshino (025) discloses a method of fabricating semiconductor devices with electron beam lithography that utilizes mask's having block (CP) apertures formed using shot number analysis based on frequency of use (See Figure 34 below; and Column 11, line 41-54). In addition, the results of the shot number analysis are presented graphically (See Figure 37 below) showing the shot count difference between VSB and block (CP) selection, as recited in claims 20-23,25,27, 29-31, and 33. See Column 19, line 60-67; Column 20, line 1-45; Figure 34; and Figure 37 below.

FIG. 34

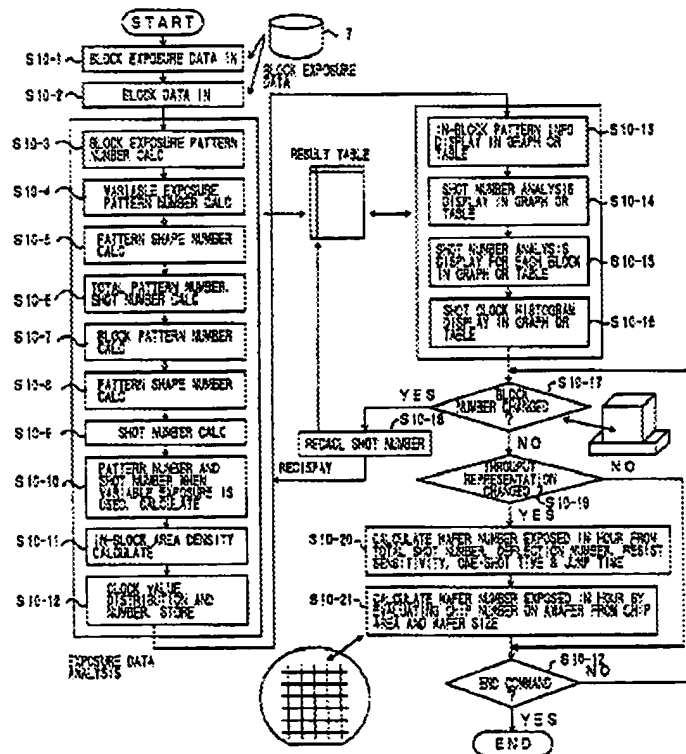
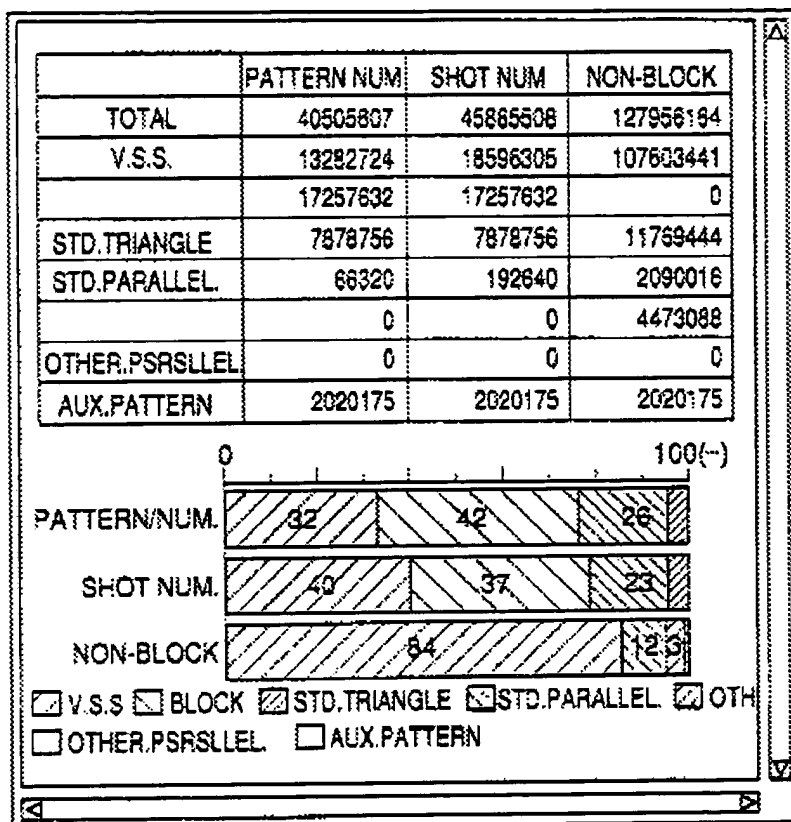


FIG. 37



Therefore it would have been obvious to one of ordinary skill in the art that the cell projection lithography apparatus and method of Kawakami (544) can be modified to use the shot analysis of Hoshino (025), to provide a method for discriminating between exposure patterns exposed according to different exposure processes, such as a variable-beam exposure process, and a block exposure process, thereby the number of shots in the exposure is reduced sharply, and the throughput of exposure is improved substantially.

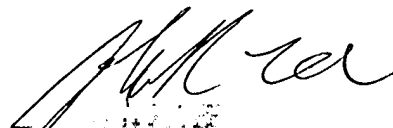
**Conclusion**

4. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 6:30 am to 3:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

December 15, 2005



PHILLIP JOHNSTON  
EXAMINER  
DEC 15 2005